ecology and environment, inc.
108 SOUTH WASHINGTON, SUITE 302, SEATTLE, WASHINGTON 98104, TEL. 206-624-9537
International Specialists in the Environmental Sciences

MEMORANDUM

DATE: 7/8/82

SUBJ: Yakima Agricultural Research Laboratory, U.S.D.A.

TO: John Osborn

REF: TDD 10-8206-01

FROM: Jacqueline Betz

CC: Phil Wong

1.0 SUMMARY

The U.S. Department of Agriculture's Research Laboratory in Yakima, Washington, has been researching pesticides since 1961. Many unknown formulations of pesticides are analyzed and consequently disposed of in a septic tank that has a drainfield system.

Because the geology of the area is characterized by sands and gravels with high permeability, there is concern that pesticides may be leaching into the drinking water aquifer.

The Field Investigation Team (FIT) conducted a preliminary site investigation on June 24, 1982. The plant manager was (b)(6) and no one was knowledgeable about the history of pesticide disposal methods and no maps were available to indicate the exact location of the drainfield system at the time. An HNU photoionizer, placed in shallow holes south of the septic tank dug by the FIT detected volatile organics in the soil above the background level. These volatile compounds were thought to be from the petroleum carrier solution mixed with the pesticides.

2.0 PHYSICAL DESCRIPTION

2.1 LOCATION

The U.S. Department of Agriculture's Research Laboratory, 3706 West Nob Hill Blvd., Yakima, Washington 98902, is located within the city limits of Yakima in Section 27, Range 18 East, Township 13 North, Yakima West Quadrangle: Latitude 46°36'57", Longitude 120°33'37" (see Figure 1). The area is zoned for mixed use (commercial, residential, industrial).

2.2 CLIMATE AND WATER BUDGET

According to the Climatic Atlas of the United States (U.S. Department of Commerce, 1968) this area receives approximately 8 inches of total precipitation annually with a mean annual lake evaporation of 42 inches. Approximately 75 percent of the precipitation falls in the period October through March.

The area is characterized by a dry continental climate because it lies in the rain shadow of the Cascade Mountain Range. The hottest months are June-August with temperatures as high as 100°F. The coolest months are December-February with minimum temperatures in the 20's F.

2.3 GEOLOGY AND HYDROLOGY

Well logs indicate the immediate area is underlain by a sandy gravelly loam on top of a cemented sand and gravel referred to in some well logs as conglomerate. Soil permeability is high and slopes are low (<2%). Water yields in these gravels is relatively low but adequate for domestic needs. The major aquifer is in the Yakima basalt at depth (Foxworthy, 1962).

The water table is shallow (<20 feet), mainly because of extensive irrigation in the area during the summer, and also influx from creeks draining the mountains. Groundwater flow is to the southeast towards the Yakima River.

Well logs for domestic wells are not required by the County of Yakima, therefore, groundwater use in the vicinity cannot be quantifed. However, there are some well logs filed that indicate shallow wells downgradient are presently being used for private domestic purposes (see Well Logs, Attachment A). The primary use of groundwater in this area is for irrigation. Public water is supplied by the City of Yakima from the Naches River.

2.4 LAND USE AND SENSITIVE HABITATS

The area surrounding the site is within metropolitan Yakima. More than 10,000 people live within a mile of the site. According to the U.S. Fish and Wildlife Service (USFW) no known threatened or endangered species inhabit this area. It is not registered as a critical habitat by the USFW.

3.0 DISPOSAL PRACTICES

The research facility generated little waste from its beginning in 1961 through 1968 according to B. Brown, Administrative Officer. Wastes from 1961 through 1968 were disposed of on the ground. About 1968 the septic tank and drainfield system were installed to dispose of unused mixed pesticides from spray application equipment, wastes from a mixing formulation laboratory and rinse water from spray application equipment. A sink and toilet also drain into the 300 gallon septic tank.

The USDA estimates that about 250 gallons of mixed pesticides and about 5000 gallons of rinsate from the application equipment are injected into the septic tank each year.

4.0 PRELIMINARY SITE INVESTIGATION

On June 24, 1982, the FIT visited the site with Dennis Bowhay, Washington State Department of Ecology. An HNU photoionizer, used to check for organics in the soil, showed several readings above the background level in the area to the south of the septic tank (see attached maps of the facility). There was a slight chemical odor. The cement drain for the septic tank was in active use while the FIT was on site (see photographs, attached).

5.0 DISCUSSION

About 250 gallons of mixed pesticides and 5000 gallons of rinsate has been disposed of annually for the last 14 years at this site. It is assumed that some of these pesticides are toxic and persistent and pose a threat to human health and the environment. There is the possibility of offsite migration of pollutants into the unconfined aquifer, used downgradient for private domestic drinking water wells.

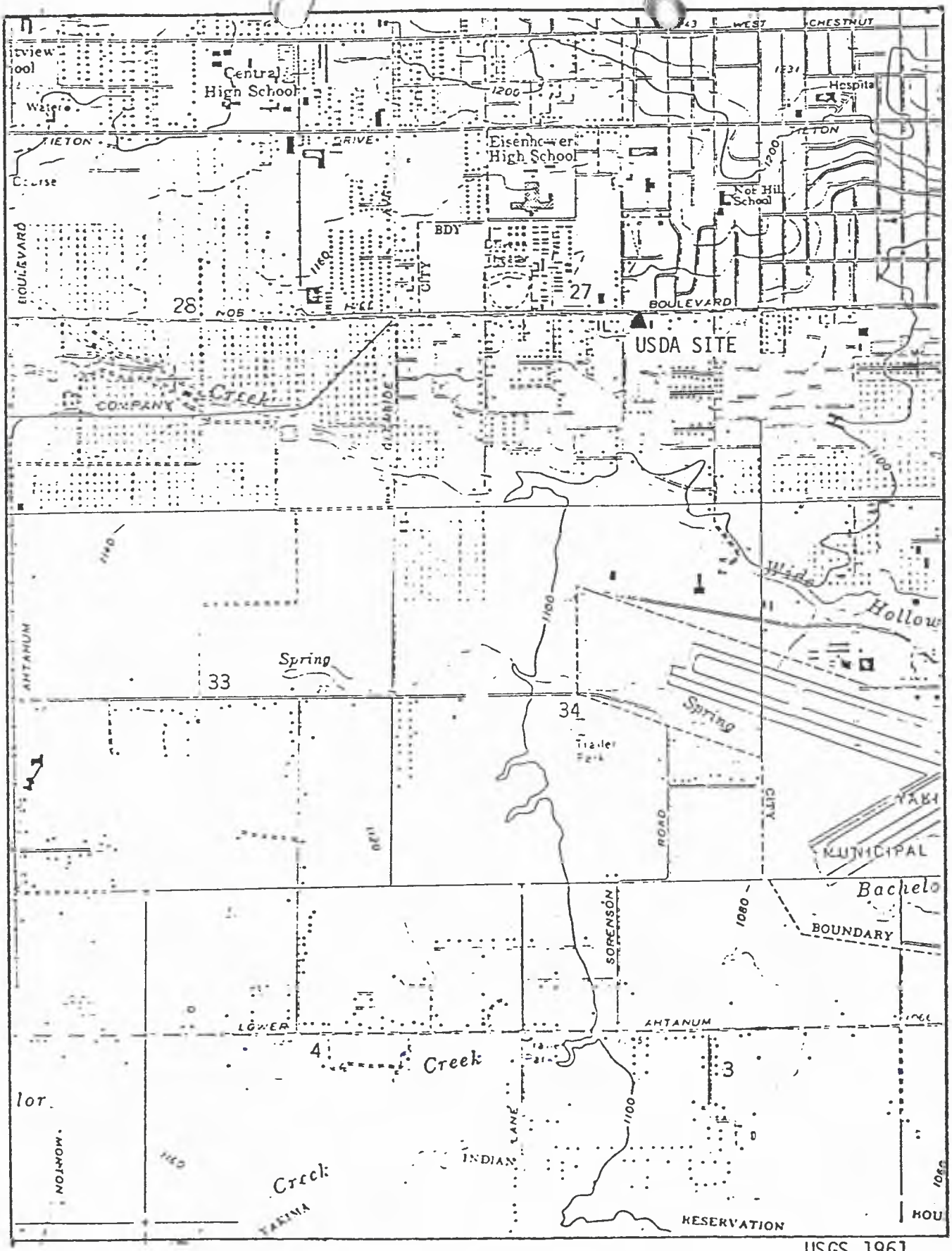
6.0 CONCLUSIONS AND RECOMMENDATIONS

Unknown formulations of mixed pesticides are likely to be leaching into the groundwater and migrating offsite. The FIT recommends that domestic wells in the area be sampled and analyzed for priority pollutants and pesticides. An upgradient domestic well could be used as a monitoring well and a minimum of two downgradient wells onsite should be installed to determine what migration may be taking place.

REFERENCES

Foxworthy, B.L., 1962, Geology and groundwater resources of the Ahtanum Valley, Yakima County, WA. U.S. Geological Survey, Water Supply Paper 1598.

U.S. Geological Survey (USGS), 1958, (photorev. 1974) Yakima West, WA.: National Topography Map Series, Scale 1:24,000.



Scale 1:24,000

USGS 1961

FIGURE 1

YAKIMA AGRICULTURAL RESEARCH LABORATORY, YAKIMA, WA

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No. /

Permit No.

(1) OWNER: Name (b)(6) Address (b)(6) Yakima, Wash.

(2) LOCATION OF WELL: County Yakima — SW¼ SE¼ Sec. 27 T. 13 N., R. 18 W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic [X] Industrial [ ] Municipal [ ]
Irrigation [ ] Test Well [ ] Other [ ]

(4) TYPE OF WORK: Owner's number of well (if more than one)
New well [X] Method: Dug [ ] Bored [ ]
Deepened [ ] Cable [ ] Driven [ ]
Reconditioned [ ] Rotary [X] Jetted [ ]

(5) DIMENSIONS: Diameter of well 5 inches.
Drilled ft. Depth of completed well 58 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 5 " Diam. from 0 ft. to 28'10" ft.
Threaded [ ] " Diam. from ft. to ft.
Welded [X] " Diam. from ft. to ft.

Perforations: Yes [ ] No [X]
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes [ ] No [X]
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes [ ] No [X] Size of gravel
Gravel placed from ft. to ft.

Surface seal: Yes [X] No [ ] To what depth? 18 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes [ ] No [ ]
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level Approx. 1100 ft.
Static level 17' 4" ft. below top of well Date 2-12-81
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes [ ] No [ ] If yes, by whom?
Yield: 20 gal./min. with ft. drawdown after hrs
Withdrawn " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Type of test
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water 56 Was a chemical analysis made? Yes [ ] No [X]

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Top Soil.	0	10
Conglomerate.	10	58

W

(b)(6)

S

MAR 12 1981

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Work started 2-12, 1981 Completed 2-12, 1981

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME JENSEN'S WELL DRILLING & DRIVING
(Person, firm, or corporation) (Type or print)

Address 1603 South 2nd AVE. YAKIMA, WASH.

[Signed] Chris B. Jensen Jr.
(Well Driller)

License No. 0217 Date 3-12, 1981

(USE ADDITIONAL SHEETS IF NECESSARY) K 12 - 2 11 81

ment of Ecology
Copy — Owner's Copy
Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No. /

Permit No. ...

(1) OWNER: Name (b)(6) Address (b)(6) Yakima Wash

(2) LOCATION OF WELL: County Yakima — NE ¼ SW ¼ Sec. 27 T. 13 N., R. 18 W.M.

Bearing and distance from section or subdivision corner SE 16.4' & W 16.8' of N 243.1' & S 807.1'

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 1

New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 65 ft. Depth of completed well 65 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6" Diam. from 0 ft. to 40 ft.
Threaded ☐ ." Diam. from ft. to ft.
Welded ☒ ." Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 38 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level.... ft.
Static level 11½ ft. below top of well Date 29-11-74
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom?
Yield: 7.5 gal./min. with ft. drawdown after hrs.
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
r test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Top Soil	0	4
Hardpan & Gravel clays	4	34
Sandstone Silty layers	34	51
Sand stone Hard Dry		
with Water	51	65

Work started 29-11 19 74 Completed 29-11 19 74

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Eastwood Drilling Inc
(Person, firm, or corporation) (Type or print)

Address 2202 River Rd Yakima Wash

[Signed] Chester McWatters
(Well Driller)

License No. 112 Date 29-11, 19 74

(USE ADDITIONAL SHEETS IF NECESSARY)

S. F. No. 7356—OS—(Rev. 4-71).

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...t of Ecology
...nd Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. C 3-20651
Permit No. G 3-20651 P

(1) OWNER: Name City of Yakima Address 129 N. 2nd St., Yakima, Wa. 98901

(2) LOCATION OF WELL: County Yakima — SW ¼ SW ¼ Sec. 27 T. 13 N., R. 18 W.M.
...nd distance from section or subdivision corner N. 50° W 320' from SE cor. SW¼SW¼

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☒ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one)....
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 8 inches.
Drilled 352 ft. Depth of completed well 352 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 12" Diam. from 0 ft. to 50 ft.
Threaded ☐ 8" Diam. from ±2 ft. to 352 ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☒ No ☐
Type of perforator used star
SIZE of perforations ½ in. by 1½ in.
2400 perforations from 245 ft. to 330 ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type Model No
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 56 ft.
Material used in seal Neat cement
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name Tait
Type: Verticle Turbine H.P. 60

(8) WATER LEVELS: Land-surface elevation above mean sea level.... 1765' ft.
Static level 18 ft. below top of well Date 9/26/73
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom Fosseens
Yield: 600 gal./min. with 60 ft. drawdown after 6 hrs.
" 500 " 62 " 10 "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
2:00	30	2:01½	30	2:05	25

Date of test 9/12/73
Bailer test 60 gal./min. with 12 ft. drawdown after 1 hrs.
Artesian flow g.p.m. Date
Temperature of water 55 Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
top soil tan	0	3
Conglomerate gravel & boulders firm	3	73
" gravel & sand med. soft	73	80
Sand gray loose med. to fine	80	82
Conglomerate gray firm	82	100
Sandstone with gravel & silt Med soft	100	106
Conglomerate tan med. firm	106	115
" gray hard	115	129
" gravel & sand silt brown soft	129	145
" tan hard	145	147
" Sand & gravel silted m. soft	147	202
" coarse tan heavy silt	202	215
" clay sand s. gravel soft	215	219
" tan firm	219	220
" gravel & sand-clay interbeds	220	241
" tan hard	241	246
" tan firm-narrow soft strata	246	262
Clay tan with small gravel & sand soft	262	271
Compacted small gravel-sand-silt light brown-good water soft	271	280
Clay-tan-some gravel-sand soft	280	286
Conglomerate tan (light) med. firm	286	305
Compacted sand-small gravel tan light silt (water)	305	312
Compact gravel-sand-heaver silt tan (water)	312	324
Compact sand-coarse-brown(water)	324	331
Clay with sand-tight	331	352

Major aquafers at 271ft. to 280ft.
305ft. to 331ft.

Other noticable lesser aquafers
80ft. to 82ft. 100ft. to 106ft.
Possible other unnoticable narrow leases

Work started 7/16, 19 73 Completed 9/26, 19 73

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Cassel Well Drilling (Person, firm, or corporation) (Type or print)
Address 1308 Voelker Yakima, Wn. 98902
[Signed] Larry D. Cassel (Well Driller)
License No. 0075 Date 9/28/73, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

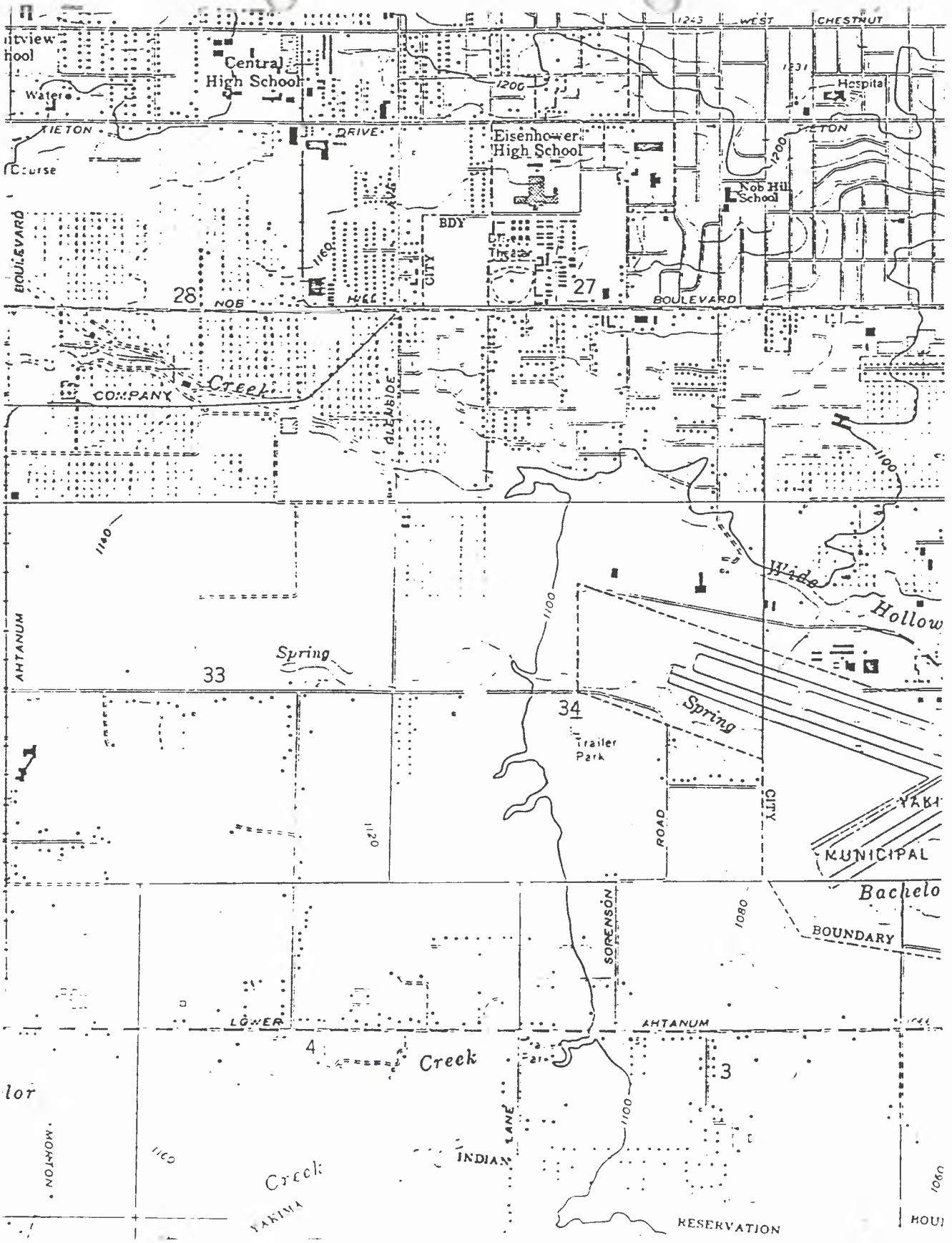

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FIGURE 1

USGS 1961

YAKIMA AGRICULTURAL RESEARCH LABORATORY, YAKIMA, WA